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E.L. Afraimovich, E.A. Kosogorov, N.P. Perevalova and **A.V. Plotnikov**: The use of GPS arrays in detecting shock-acoustic waves generated during rocket launchings 1941

N.T. Afanasiev, A.A. Zheonykh, M.K. Ivelskaya, V.I. Sazhin, M.V. Tinin and **V.E. Unuchkov**: Diagnosing the effective parameters of the ionospheric fine structure from statistical characteristics of radio waves in the vicinity of a regular caustic 1967

K. Hocke, K. Igarashi, M. Nakamura, P. Wilkinson, J. Wu, A. Pavelyev and **J. Wickert**: Global sounding of sporadic E layers by the GPS/MET radio occultation experiment 1973

J. Semeter, D. Lummerzheim and **G. Haerendel**: Simultaneous multispectral imaging of the discrete aurora 1981

G. Ma, K. Igarashi and **K. Hocke**: Mid-latitude winds in the mesosphere: a superposed epoch analysis over the geomagnetic storm times 1993

W. Schröder: Comment on the paper "Possible links between the solar radius variations and the Earth's climate evolution over the past four centuries" 2003

J.P. Rozelot: Reply on the comment to "Possible links between the solar radius variations and the Earth's climate evolution over the past four centuries" 2005

J.F. Lemaire: Corrigendum to "Hydrostatic equilibrium and convective stability in the plasmasphere" [Journal of Atmospheric and Solar-Terrestrial Physics 61 (1999) 867–878] 2007